UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,281	11/03/2003	Larry Lee Schumacher	5854-00500	4501

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/700,281	SCHUMACHER ET AL.
	Examiner	Art Unit	
	Michael Wilser	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *03 November 2003*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *November 3, 2003* is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *3/22/04 & 6/22/05*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-20 are pending in this application.

Drawings

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "640" has been used to designate both CPU count and extractor.

3.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 222 in Figure 2B.

4.   Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5.   The disclosure is objected to because it contains an embedded hyperlink

and/or other form of browser-executable code. Applicant is required to delete the

embedded hyperlink and/or other form of browser-executable code. See MPEP §

608.01.

6.   The disclosure is objected to because of the following informalities: the

examiner notes the use of acronyms (e.g. MCS, XML, API, etc.) throughout the

specification without first including a description in plain text, as required.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

7.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or
> composition of matter, or any new and useful improvement thereof, may obtain a patent
> therefor, subject to the conditions and requirements of this title.

8.   Claims 17-20 are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter. Claims 17-20 are rejected

under 35 U.S.C. 101 because the claimed invention are directed to an application

claim, but appear to be comprised of software alone without claiming associated

computer hardware required for execution (i.e. a claim 17 recited application

having multiple processes connected by input and output ports). Thus it is a

software program/application that comprises software modules to perform a

certain function.

Claim Rejections - 35 USC § 102

9.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in
> public use or on sale in this country, more than one year prior to the date of application for patent in
> the United States.

10.   Claims 1-9 and 17-20 are rejected under 35 U.S.C. 102(b) as being

anticipated by Tabloski, Jr. et al. (US 5,999,729).

11.   As per Claim 1, Tabloski teaches the invention as claimed including a

method for executing a dataflow application (column 5, lines 25-27) comprising:

        a. providing a dataflow application comprising a plurality of map

components and data ports, a number of map components being linked between

data ports and each map component comprising one or more processes

(abstract, lines 10-14 & column 1, line 65 – column 2, line 3);

      b. allocating a processing thread to each respective process (abstract,

lines 18-21); and

      c. executing multiple processes in parallel (abstract, lines 1-3).

12.   As per Claim 2, Tabloski further discloses assigning runtime properties to

the prepared map prior to execution (column 2, lines 7-12).

13.   As per Claim 3, Tabloski further discloses certain map components

include input ports and output ports and the executing step includes reading the

data tokens from respective input ports and writing data tokens to respective

output ports (column 2, lines 53-67).

14.   As per Claim 4, Tabloski further discloses choosing the port

implementations to a specific data type prior to the executing step (column 1, line

65 – column 2, line 3).

15.   As per Claim 5, Tabloski further discloses some of the ports being

hierarchical comprising a plurality of hierarchical ports and the data being

partitioned for parallel processing (column 2, lines 59-62).

16.   As per Claim 6, Tabloski further discloses transporting data tokens among

map processes (column 2, lines 63-65).

17.   As per Claim 7, Tabloski further discloses batching the data tokens to

regulate the length of time a map process may execute without synchronization

(column 21, lines 10-20).

18.   As per Claim 8, Tabloski further discloses ports associated with each map

process for representing and transporting multi-state null value tokens (column

17, lines 48-56).

19.   As per Claim 9, Tabloski further discloses null value tokens including an

error null (column 18, lines 56-65).

20.   As per Clam 17, Tabloski teaches the invention as claimed including a

dataflow application having multiple processes connected by data input and

output ports wherein at least some ports are implemented to indicate multiple

state null value data tokens (column 2, lines 53-67).

21.   As per Claim 18, Tabloski further discloses the multiple state null value

port operations support at least three state logic (column 17, lines 48-56).

22.   As per Claim 19, Tabloski further discloses the multiple state null values

support at least a system defined error null token (column 18, lines 58-65).

23.   As per Claim 20, Tabloski further discloses the system defined error null

being passed to a map component for later determination of a system error

condition (column 18, lines 58-65).

Claim Rejections - 35 USC § 103

24.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

25.   Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Tabloski Jr. et al. (US 5,999,729) in view of Ma et al. (US 2004/0025164).

26.   As per Claim 10, Tabloski teaches the invention substantially as claimed

including a method of deadlock management in a multi-thread, parallel

processing data management system having ports for sending and receiving

data tokens (abstract 10-14 & column 1, line 65 – column 2, line 3) comprising:

a. allocating at least one thread to a first process and at least one thread to a second process, wherein the first and second processes are connected through a queue via ports (column 7, lines 49-56 & column 6, lines 60-64); and

b. determining if a thread is blocked, waiting on another thread, and determining if the blocked thread is sending data or receiving data (abstract, lines 23-27).

27.   However, Tabloski does not explicitly disclose of determining if a deadlock exists by building a wait graph of blocked threads in the system and determining if the graph is cyclic indicating a deadlock does exist. However, Ma disclose a method that does determine if a deadlock exists by building a wait graph of blocked threads in the system and determines if the graph is cyclic indicating a deadlock does exist (abstract, lines 1-8).

28.   It would have been obvious to one of ordinary skill in the art to have had Ma's deadlock detection method be the deadlock detection in Tabloski's invention since Tabloski is already determining if an error condition has occurred or if a action further down stream is waiting on data from a previous process it would be obvious to check for a deadlock since deadlocks can be common problems in multithreaded computing systems.

29.   As per Claim 11, Tabloski further discloses blocking a receiving port when a limit on the number of data tokens in the queue is reached (abstract, lines 20-22).

30.   As per Claim 12, Tabloski further discloses blocking a sending port when a limit on the number of data tokens in the queue is reached (abstract, lines 20-22).

31.   As per Claim 13, Ma further discloses building a wait graph with the blocked threads and traversing the wait graph to determine if it is cyclic (page 3, paragraph 32).

32.   As per Claim 14, Tabloski further discloses correcting the deadlock by allowing the limit of data tokens on a queue to increase (column 22, lines 38-45).

33.   As per Claim 15, Tabloski further discloses the limit of a queue associated with a sending port is allowed to increase (column 22, lines 38-45).

34.   As per Claim 16, Tabloski further discloses the token batch size of another queue is decreased while the limit of the queue is increasing (column 22, lines 35-50).

Conclusion

35.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

        a. Chelcea et al. (US 7,197,582) Low Latency FIFO Circuit for Mixed

Clock Systems.

        b. Hutchinson et al. (US 2003/0023656) Method and System for Deadlock

Detection and Avoidance.

        Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Michael Wilser whose telephone number is

(571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00

EST (Alt Fridays Off).

        If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax

phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

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direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

MPW
November 7, 2007

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